U.S. Department of Transportation

Federal Highway Administration

TRB

TRANSPORTATION RESEARCH BOARD

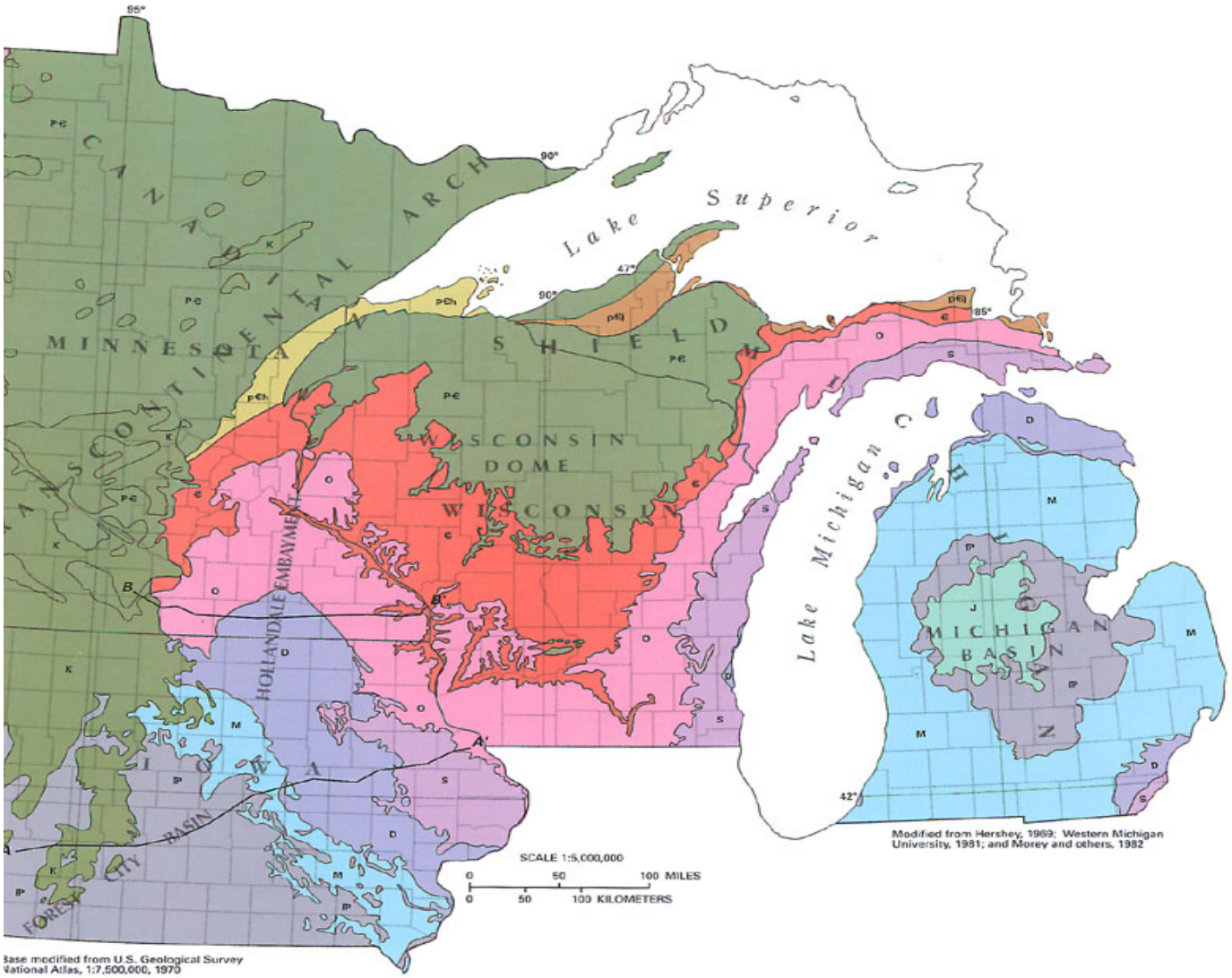
OF THE NATIONAL ACADEMIES

5th Biennial Workshop

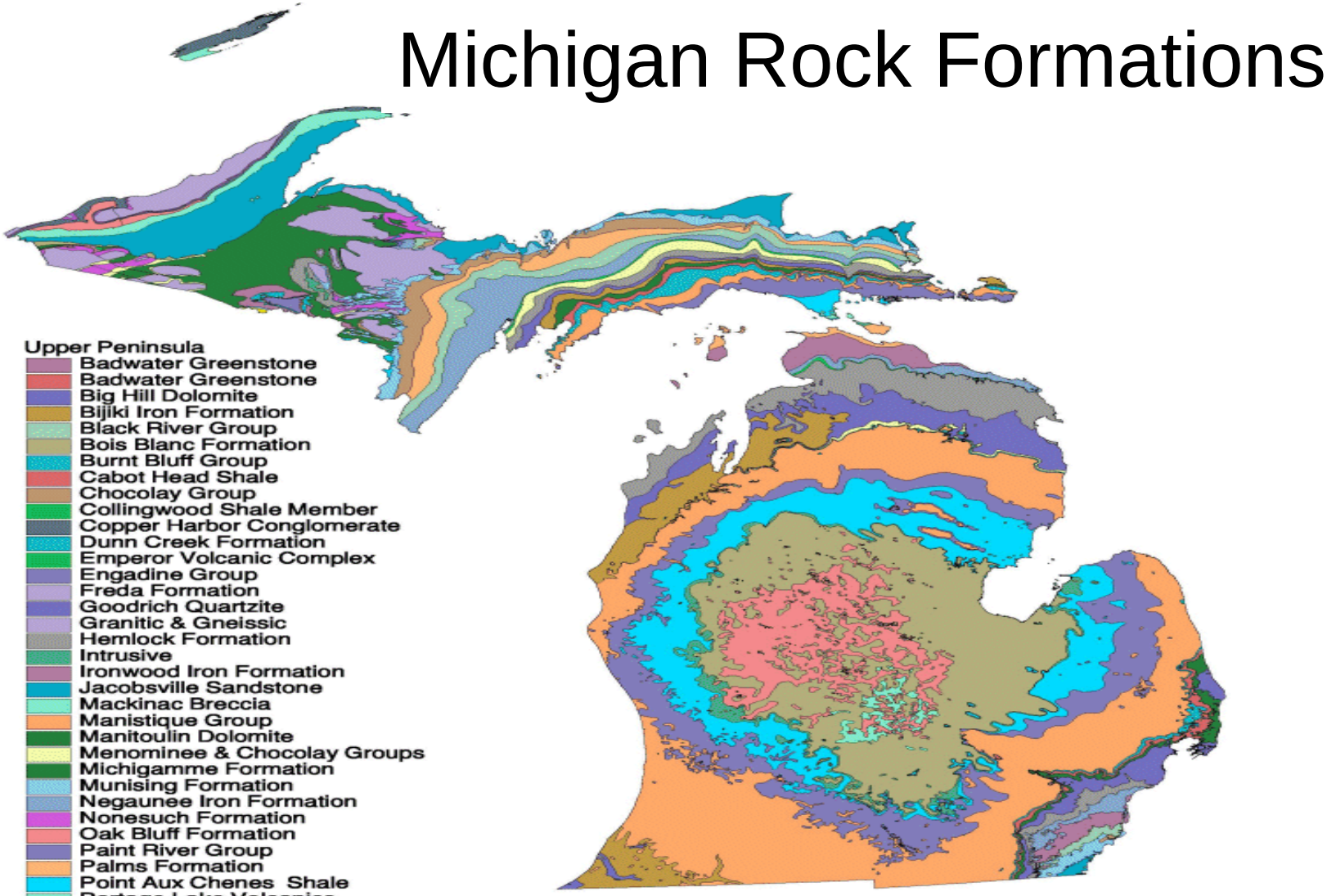
INTERSTATE TECHNICAL GROUP ON ABANDONED UNDERGROUND MINES


7-14-2001 15:24

Geologic Period of Michigan Bedrock

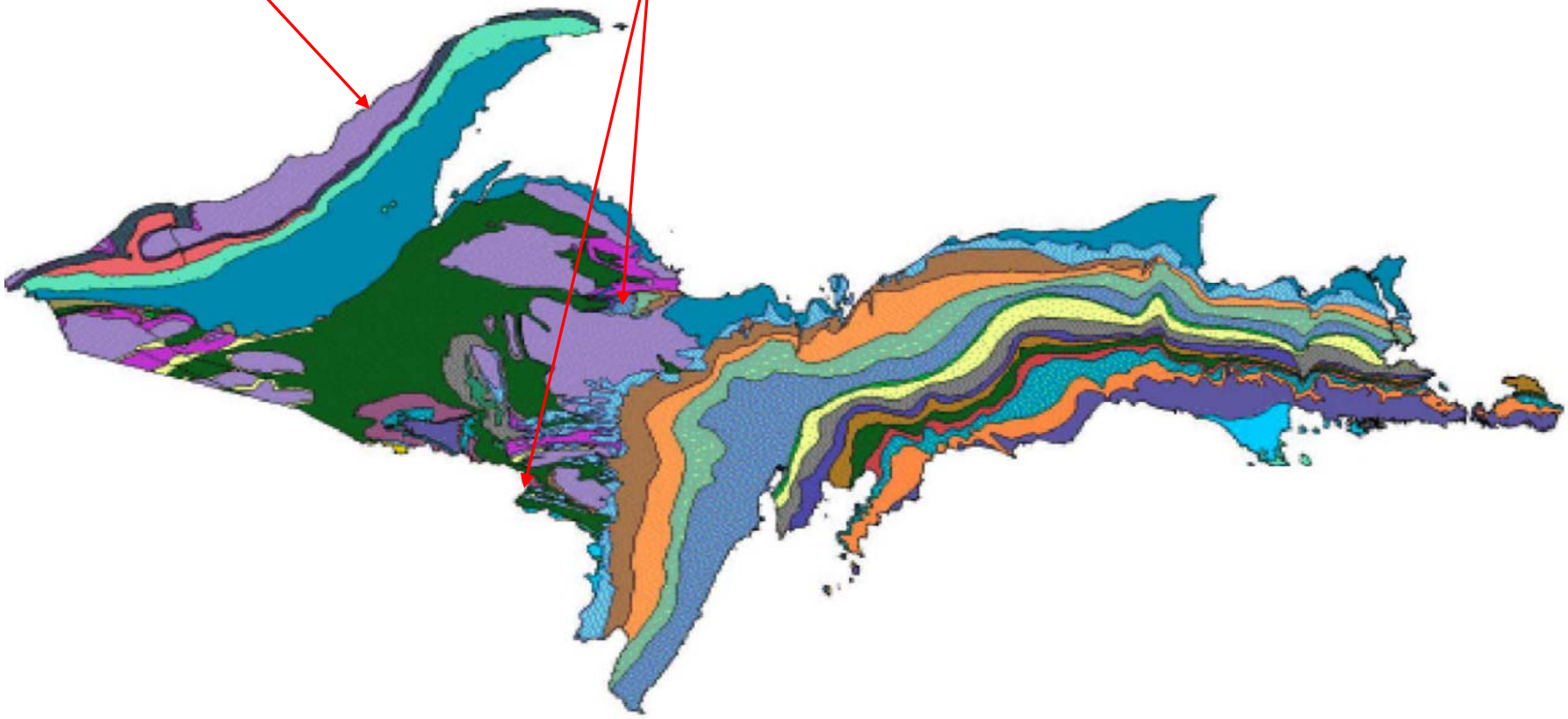


Michigan Rock Formations



Copper Mining In Keweenaw

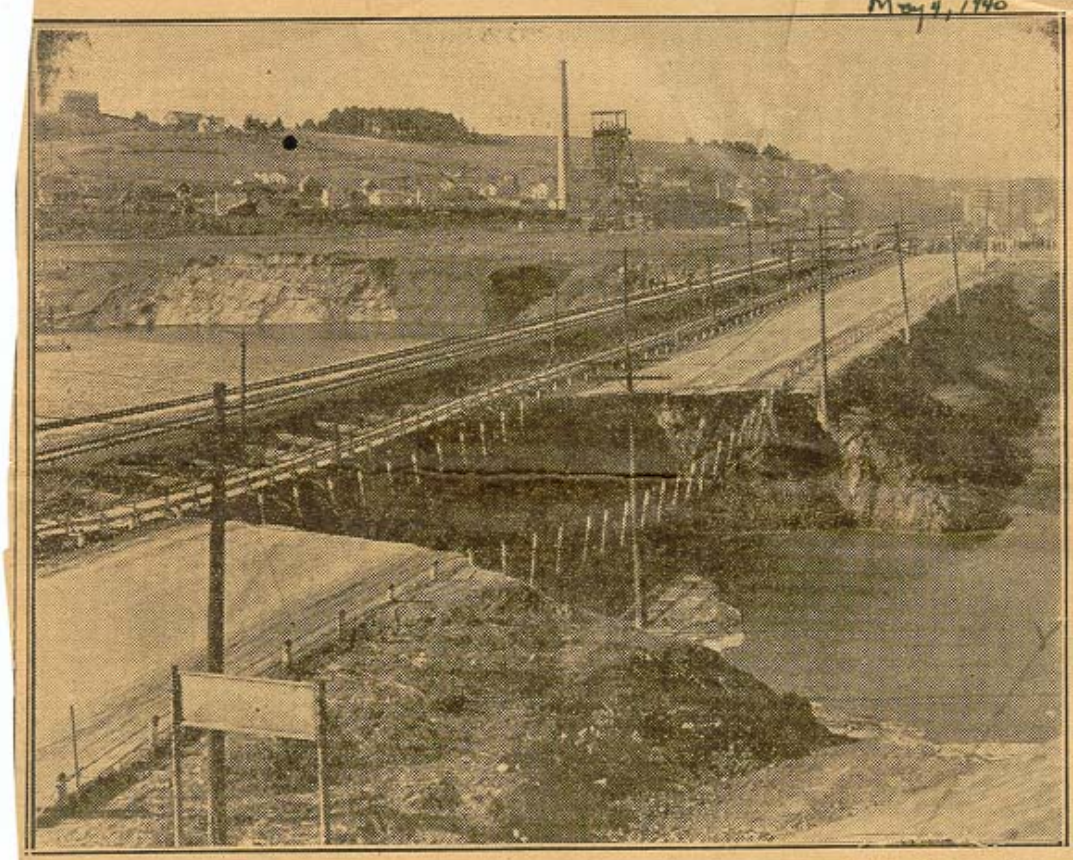
Iron Mining between Marquette and Iron Mountain



Chapin Mine, Iron Mountain, MI

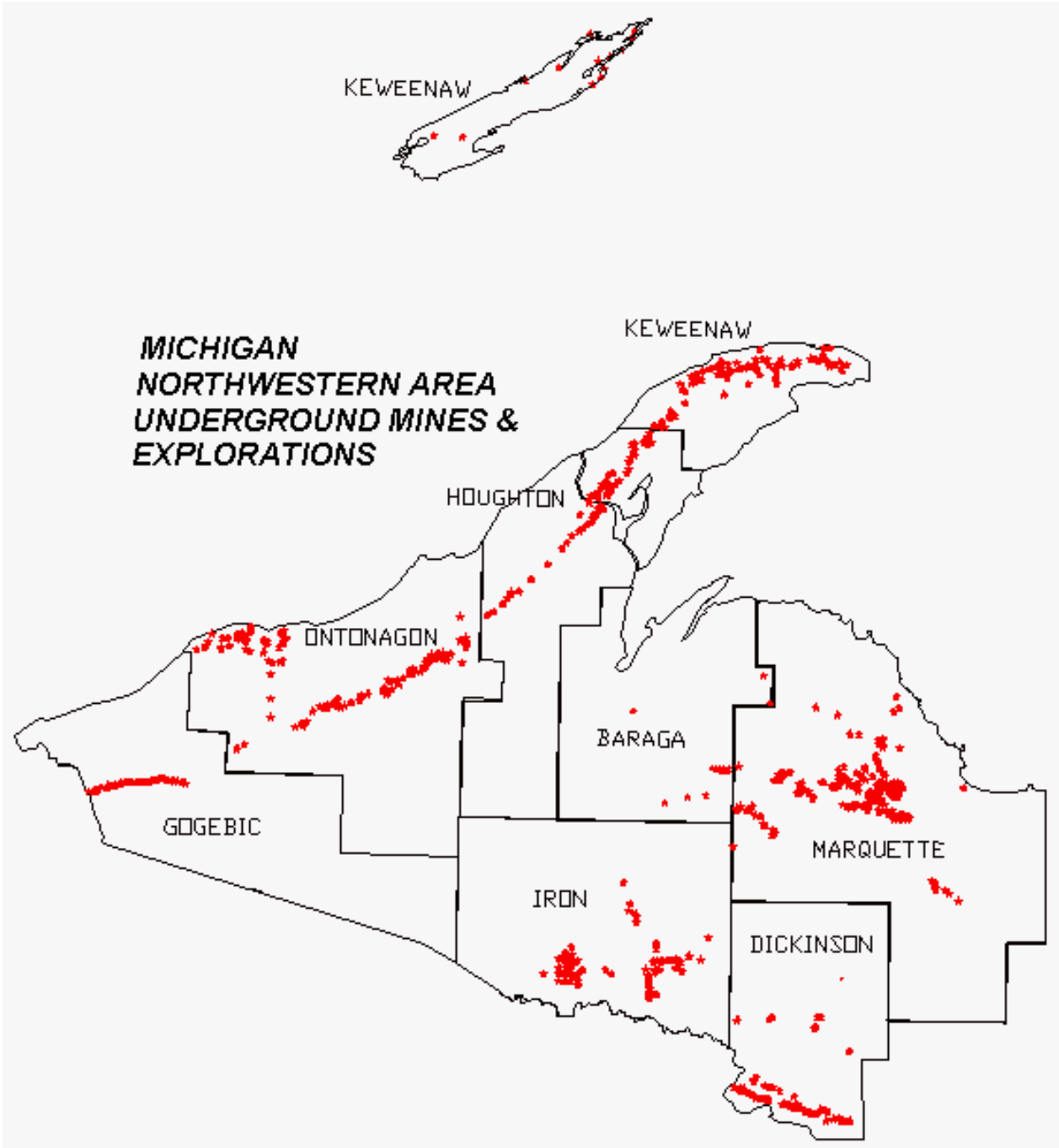
Collapse Of The Chapin Pit Highway

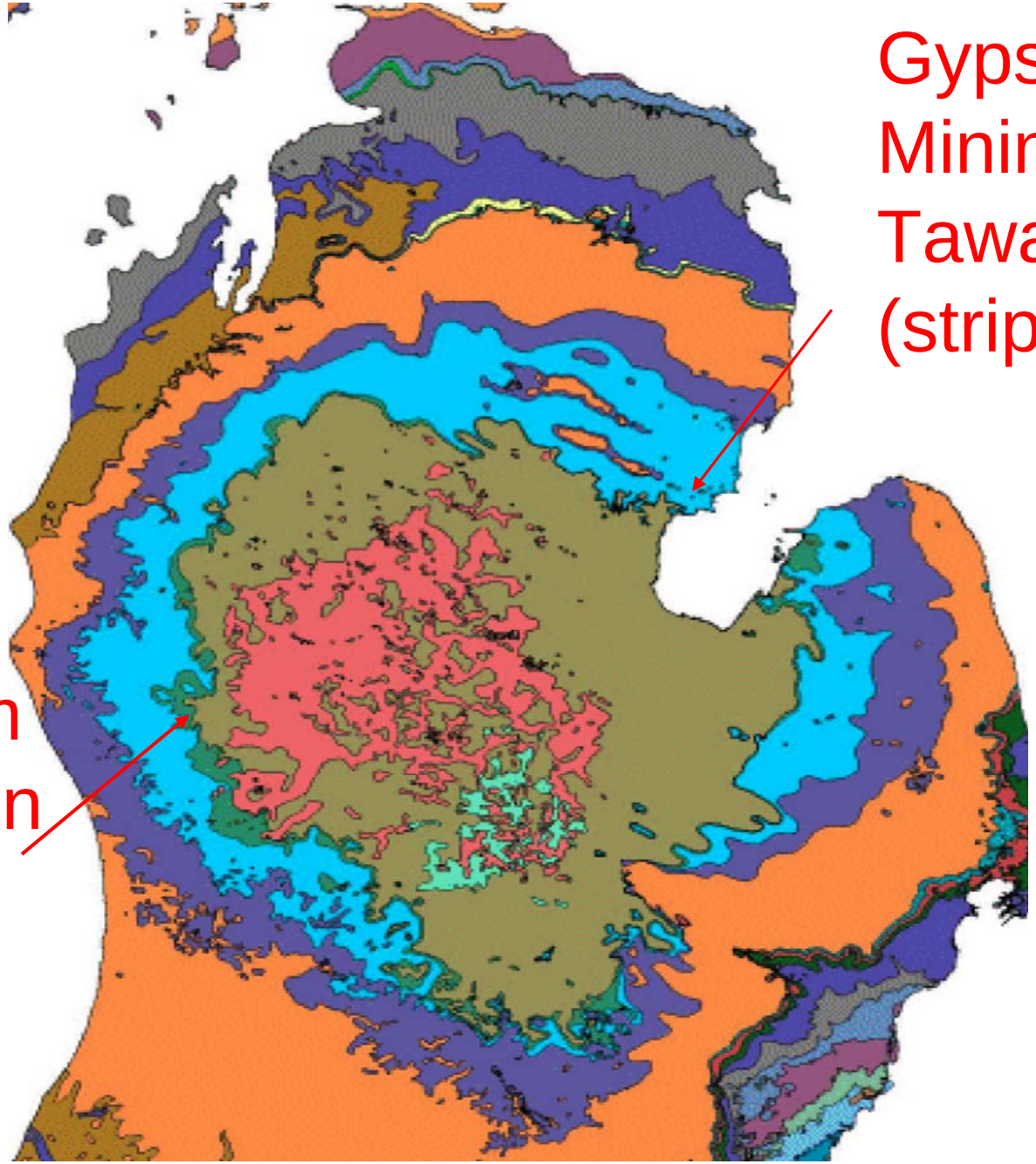
May 4, 1940



—Gordon Sullivan Photo

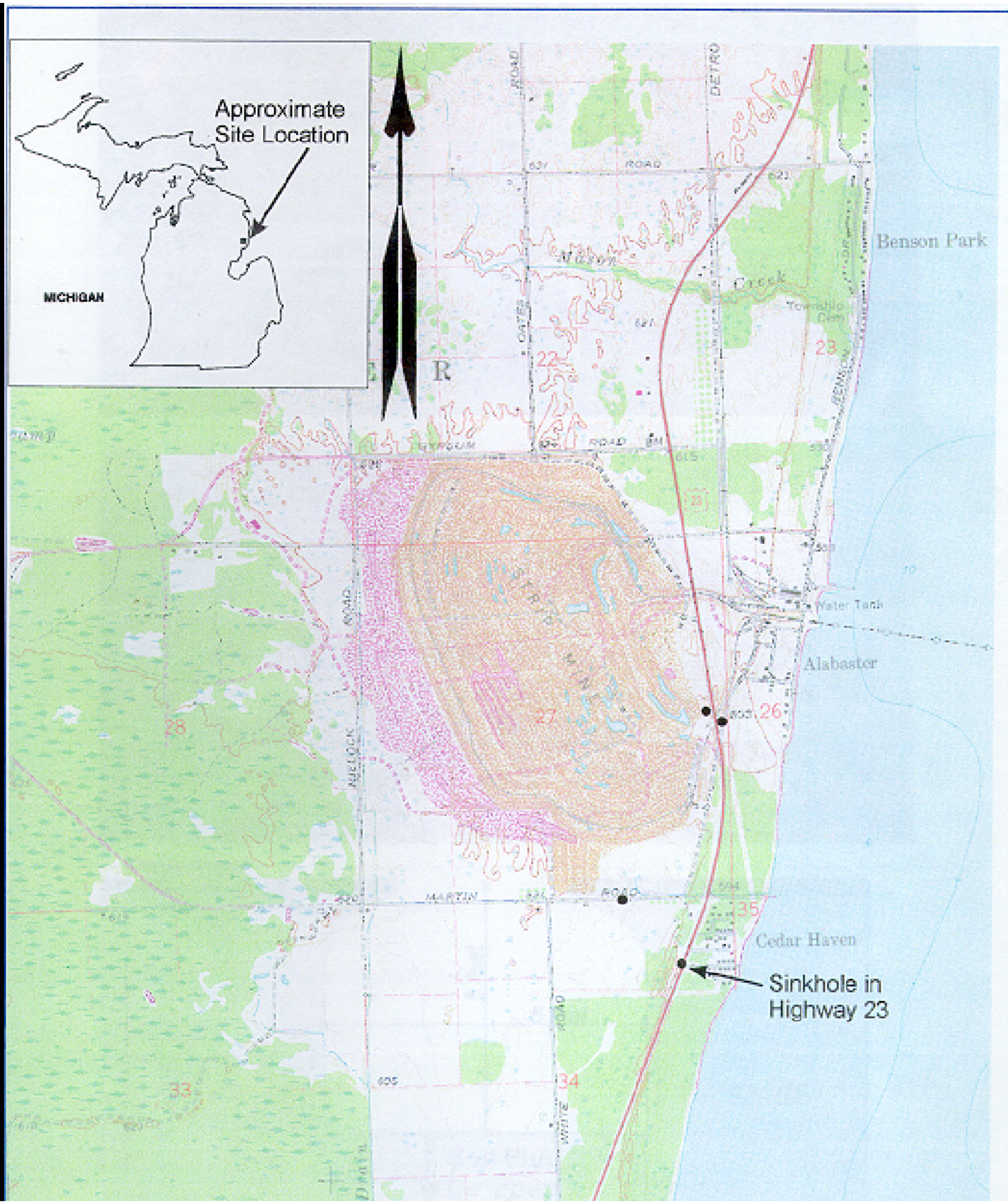
Picture shows the collapse of the Chapin pit highway crossing on Stephenson avenue yesterday afternoon. Whether the cavein was due to a sluffing out of the crossing fill or a breaking down of the old mine workings is not determined. Water at the right of the picture is about 90 feet deep, with the level being only 40 feet from the surface of the roadway. Previous to the shutdown of the Chapin mine several years ago and the suspension of pumping the pits were dry. Picture clearly indicates how the water has risen since then, finally ending in the washout of this portion of Iron Mountain's principal street. Four cars and one truck are buried somewhere in this cavein and whether they can be salvaged is still an unan-


KEWEENAW
MICHIGAN
NORTHWESTERN AREA
UNDERGROUND MINES &
EXPLORATIONS
KEWEENAW
HOUGHTON
ONTONAGON
BARAGA
GOGEBIC
MARQUETTE
IRON
DICKINSON



Gypsum Mining near Tawas City (strip mine)

Gypsum Mining in Grand Rapids (Under-ground)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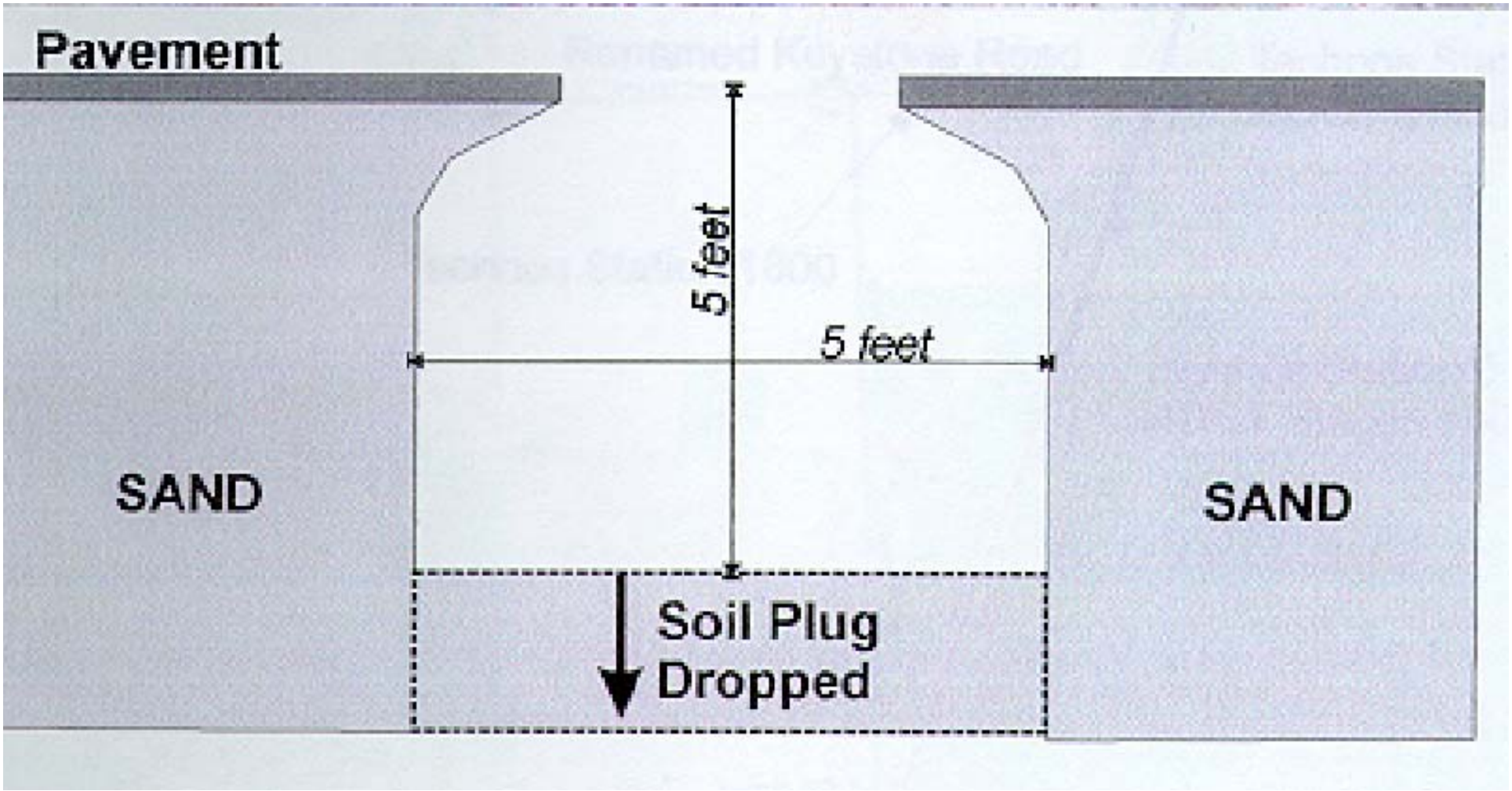
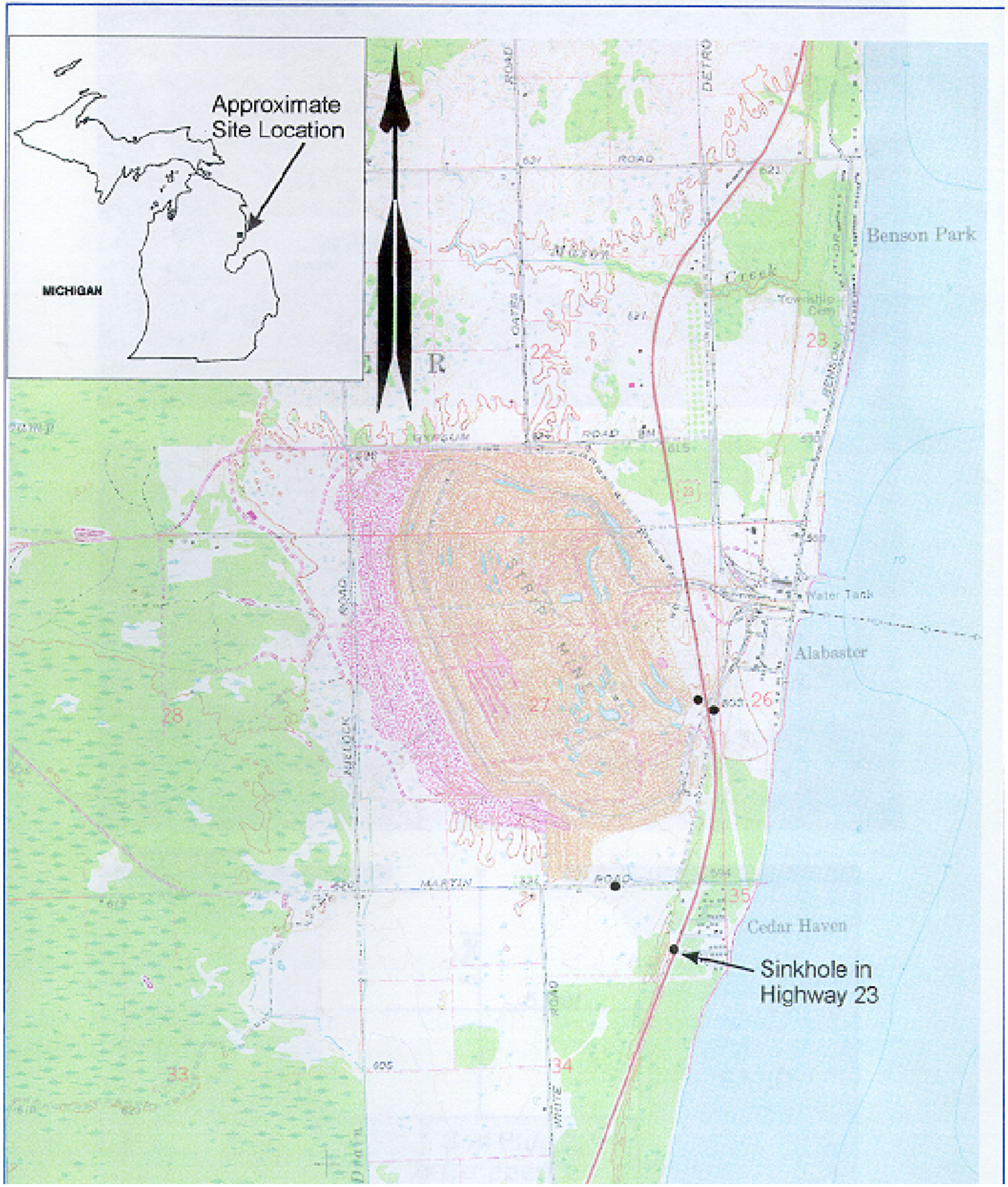
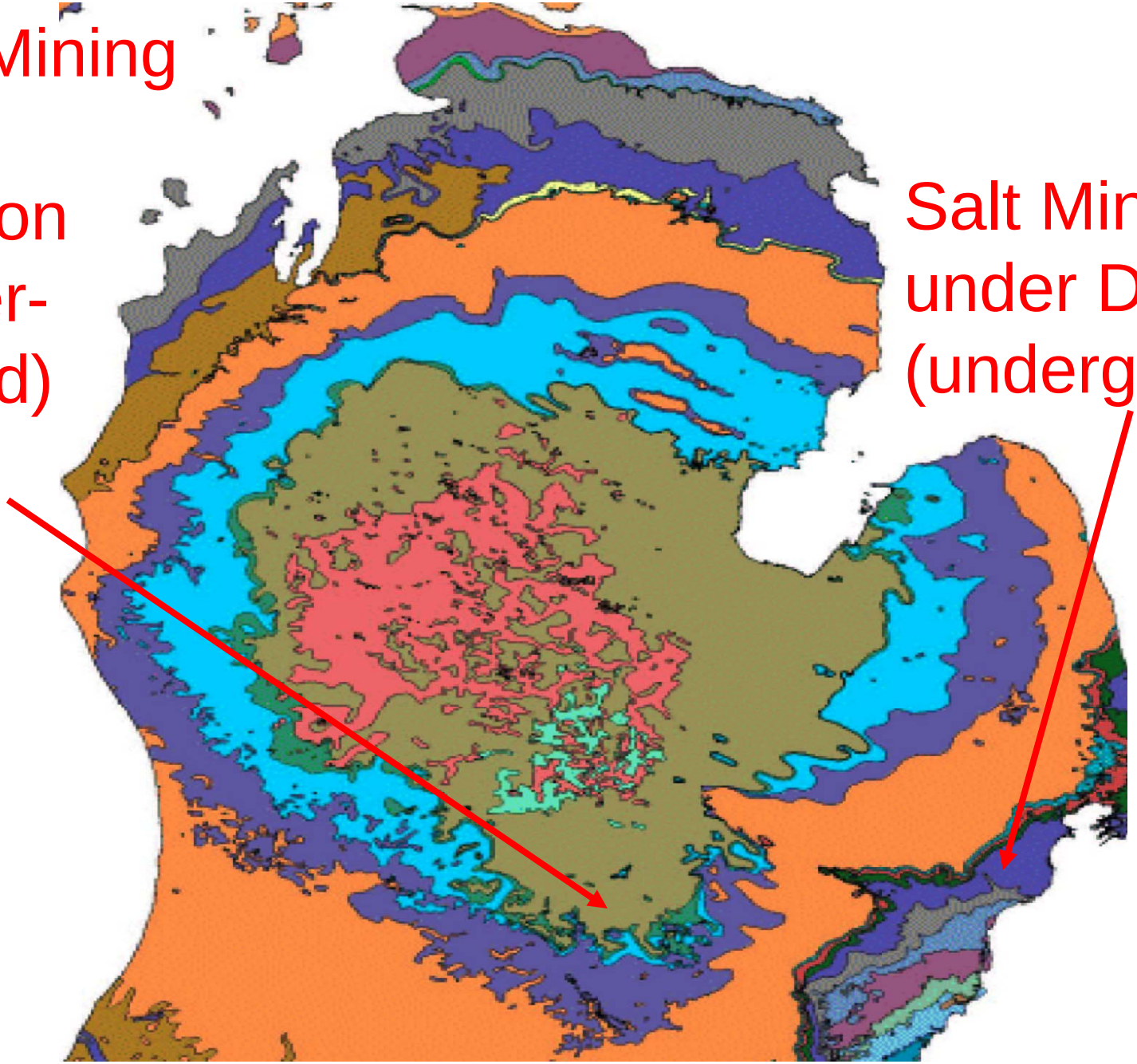
Site Location
MICHIGAN
Benson Park
Alabaster
Cedar Haven
Sinkhole in
Highway 23


Pavement
5 feet
5 feet
SAND
SAND
Soil Plug
Dropped


Approximate
Site Location
MICHIGAN
Benson Park
Water Tank
Alabaster
Cedar Haven
Sinkhole in
Highway 23

Coal Mining near Jackson (Under-ground)



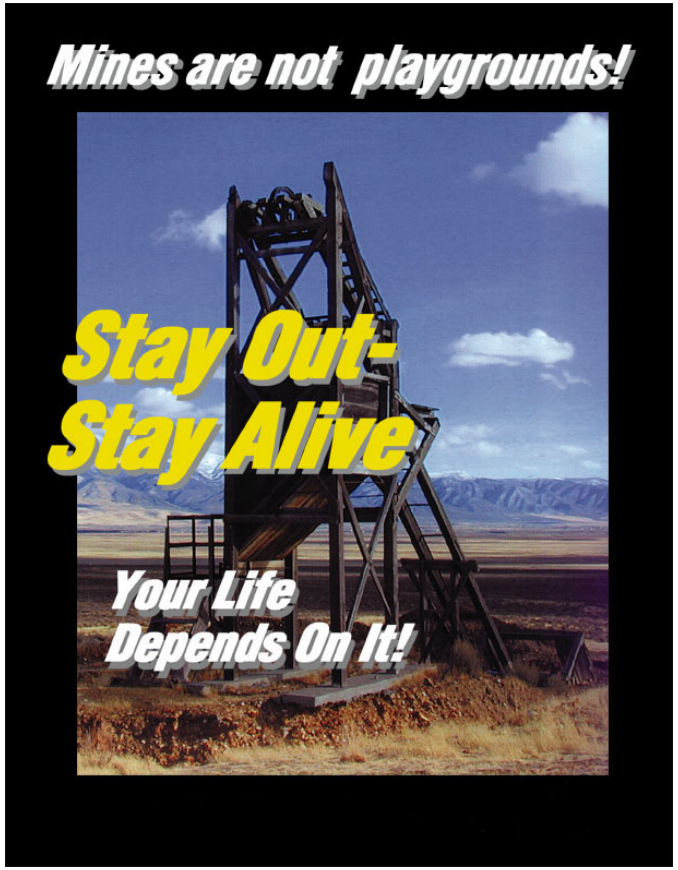
Salt Mining under Detroit (underground)

Michigan Abandoned Mine Lands Inventory

Michigan Abandoned Underground Mine Inventory was produced for the Land and Mineral Services Division, Michigan Department of Natural Resources, Lansing, Michigan.

Michigan Underground Abandoned Mines Inventory
Department of Mining Engineering,
Michigan Technological University
Phone: 906/487-2610
Email (about the web site): mining@mtu.edu

Michigan Abandoned Mine Lands Inventory

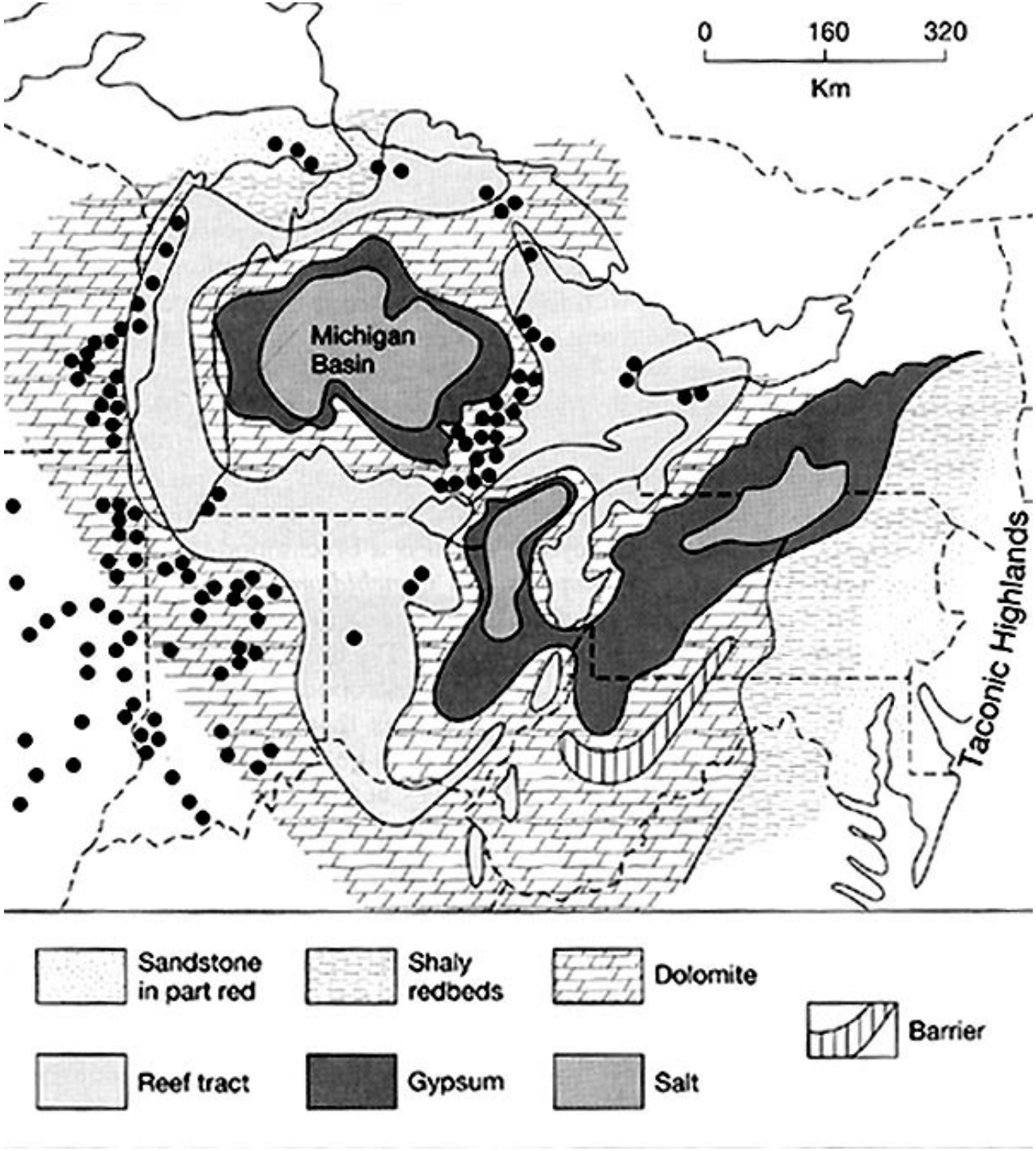


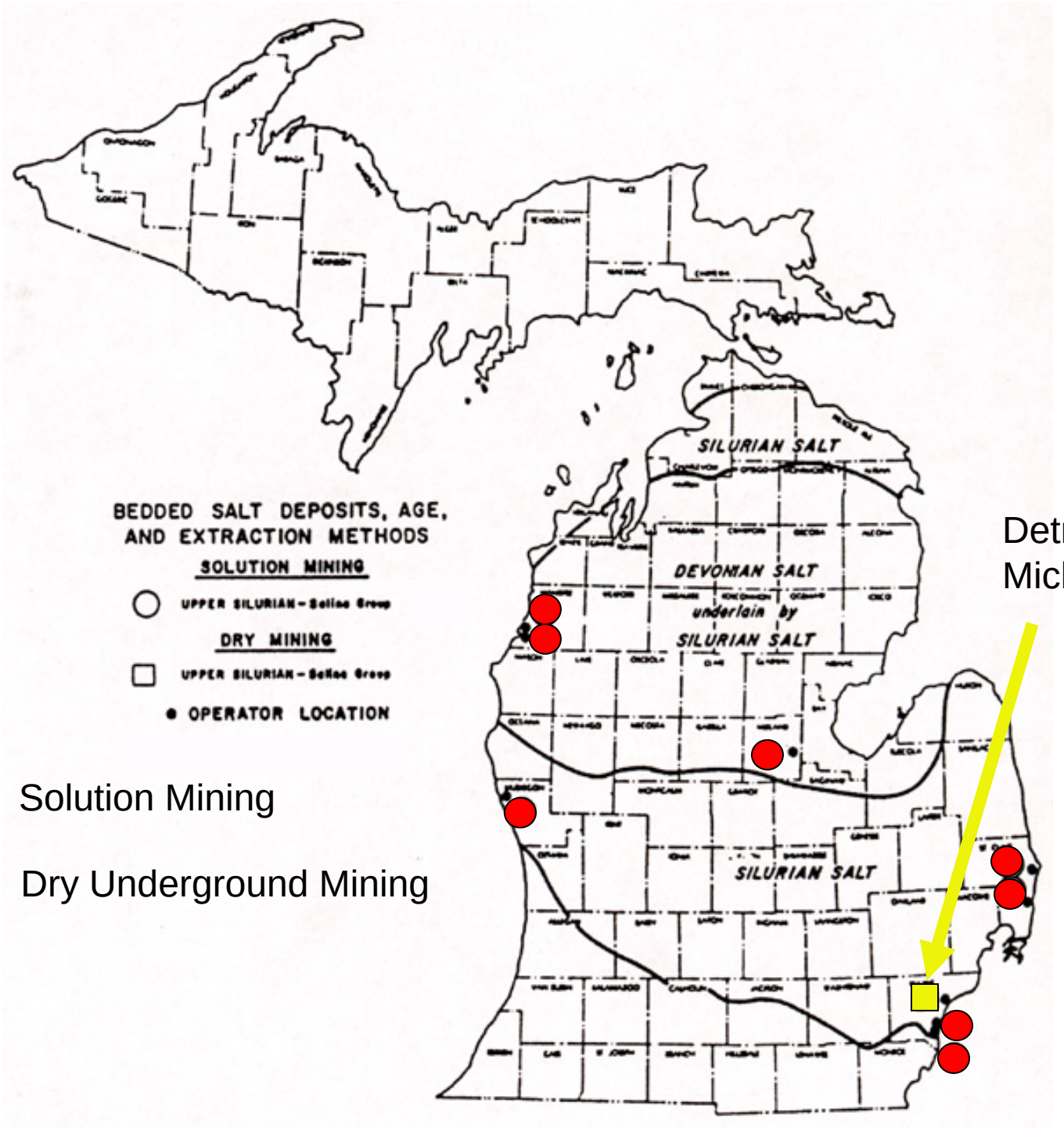
Mine Hazard Awareness Campaign Fact Sheet

Michigan Mine Inspectors

Marquette County	Mine Inspector John E. Carlson 806 N. Second Street Ishpeming, MI 49849 Phone 485-1392	Underground iron mines, several other metallic exploration shafts
Iron County	Mine Inspector Peter Korach 1904 Pisoni Street Iron River, MI 49935 906-265-9011 http://www.iron.org/government/mine_inspector.htm	Underground iron mines
Dickinson County	Mine Inspector Frank Santini 501 E. Blaine St. Iron Mountain, MI 49801 906-774-6095	Underground iron mines
Baraga County	Mine Inspector Charles Sliger (906) 355-2516	Underground iron mines
Houghton County	Mine Inspector Sulo Hiltunen 482-2484	Underground copper mines

Salt Mining in Michigan


0
160
320
Km
Michigan
Basin
Taconic Highlands
Sandstone
in part red
Shaly
redbeds
Dolomite
Barrier
Reef tract
Gypsum
Salt


BEDDED SALT DEPOSITS, AGE,
AND EXTRACTION METHODS
SOLUTION MINING
UPPER SILURIAN – Salina Group
DRY MINING
UPPER SILURIAN – Salina Group
OPERATOR LOCATION
SILURIAN SALT
DEVONIAN SALT
underlain by
SILURIAN SALT
SILURIAN SALT
Detroit,
Michigan
Solution Mining
Dry Underground Mining

Brief History

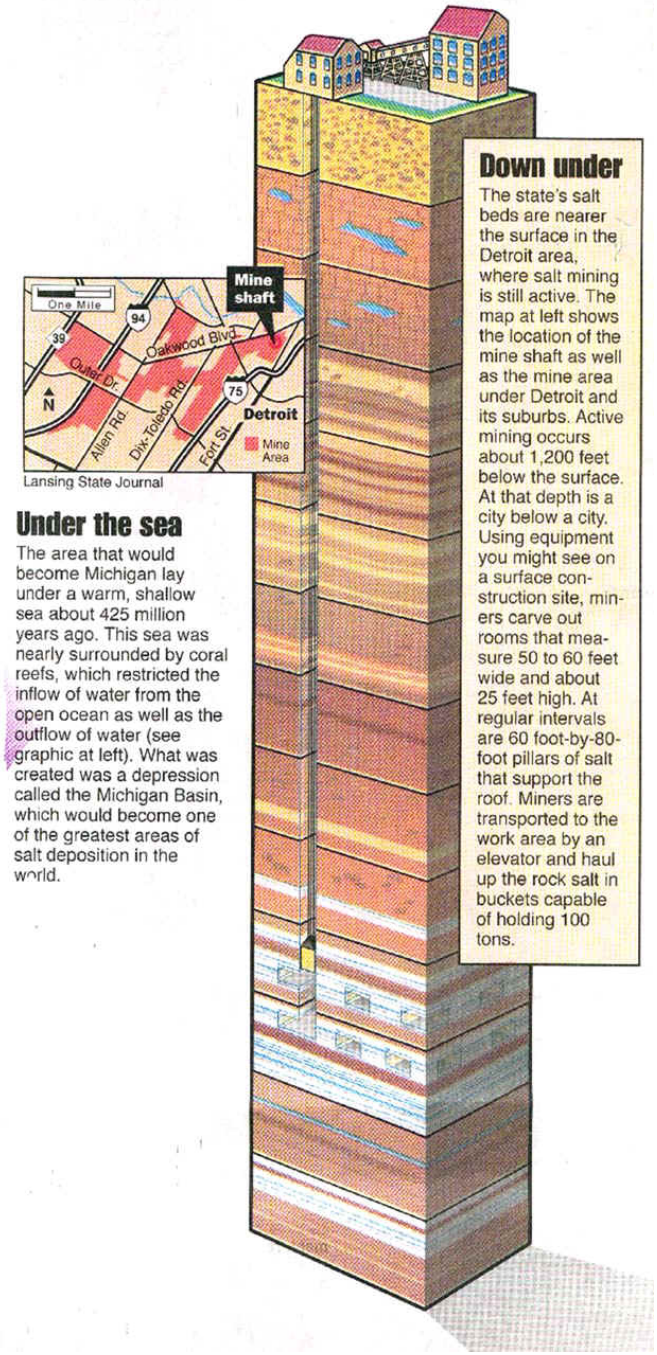
A radical change in salt production occurred in 1906 when the Detroit Salt and Manufacturing Company started sinking a shaft for underground mining of rock salt. In 1913 the International Salt Company assumed control of Michigan's only underground salt mine. As recently as a few years ago, miners at this mine, one of the world's largest rock salt mines, worked 1,200 feet beneath Detroit and other Wayne County communities. The mine, which consists of 100 miles of tunnels, has never experienced a collapse or mine fatality. The mine was closed in the 1980's but has now been reopened and is in operation.

Three important factors lie behind the location and development of the Detroit salt mining area:

1) A healthy market requiring salt for the meat processing industry, chemical industry, water softening snow and ice removal from roads and highways.

2) Abundant salt at a reasonable depth and of sufficiently high quality to permit economical mining,

3) The availability of low cost water transportation on the Great Lakes which facilitates the movement of salt in Canada from eastern Saskatchewan Province to western Quebec Province, and in the U. S. from the "Dakotas" to western New York State.



Lansing State Journal

Under the sea

The area that would become Michigan lay under a warm, shallow sea about 425 million years ago. This sea was nearly surrounded by coral reefs, which restricted the inflow of water from the open ocean as well as the outflow of water (see graphic at left). What was created was a depression called the Michigan Basin, which would become one of the greatest areas of salt deposition in the world.

Down under

The state's salt beds are nearer the surface in the Detroit area, where salt mining is still active. The map at left shows the location of the mine shaft as well as the mine area under Detroit and its suburbs. Active mining occurs about 1,200 feet below the surface. At that depth is a city below a city. Using equipment you might see on a surface construction site, miners carve out rooms that measure 50 to 60 feet wide and about 25 feet high. At regular intervals are 60 foot-by-80-foot pillars of salt that support the roof. Miners are transported to the work area by an elevator and haul up the rock salt in buckets capable of holding 100 tons.